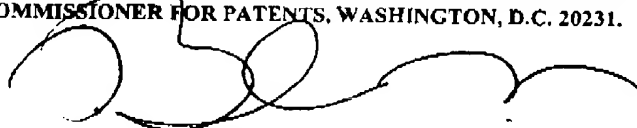


PATENT
Expedited Procedure
Appeal Brief
Under 37 CFR 1.192

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

"Certificate of Facsimile Under 37 C.F.R. 1.8"

I hereby certify that this correspondence is being transmitted via facsimile on **21 JUNE 2002** to Group 1700 (703-872-9311) addressed to: **ASSISTANT COMMISSIONER FOR PATENTS, WASHINGTON, D.C. 20231.**



ROLAND K. BOWLER II

In re application of)	
)	Atty. Docket No. 8313
MISZCZAK ET AL.)	
)	Examiner M. Elve
Appl. No. 09/227,242)	
)	Art Unit 1725
Filed 8 January 1999)	
For: "Ultra Low Carbon Metal-Core Weld Wire")	

37 CFR 1.192 TRANSMITTAL

Assistant Commissioner for Patents
Washington D.C. 20231

SIR:

The following is enclosed in connection with the Notice of Appeal filed on 21 March 2002:

- ☒ Appeal Brief under 37 CFR 1.192 (21 pages);
- ☒ Petition for an extension of time under 37 CFR 1.136; and
- ☒ Authorization to debit Deposit Account No 02-3290 in the amount of \$ 430.00 for the fees calculated below.

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

FEE Calculation			Rate	Fee
Total Claims	37 CFR 1.16(a)	0 in excess of 20.	\$ 18.00	\$ 00.00
Independent Claims	37 CFR 1.16(b)	0 excess of 3.	\$ 80.00	\$ 00.00
Appeal Brief	37 CFR 1.192		\$ 320.00	\$ 320.00
Petition Fee	(37 CFR 1.136(a))	One (1) Month	\$ 110.00	\$ 110.00
TOTAL FEES				\$ 430.00

AUTHORIZATION TO DEBIT DEPOSIT ACCOUNT

The Commissioner for Patents & Trademarks is hereby authorized to debit any additional fees required under 37 C.F.R. 1.16 and 1.17 from, and to credit any excess fees paid herewith to, Deposit Account No. 02-3290 of the undersigned in connection with the papers presented herewith.

Respectfully submitted,

ROLAND K. BOWLER II 21 JUNE 2002
REG. NO. 33,477

TELEPHONE: 847-229-9966
FACSIMILE: 847-229-9967

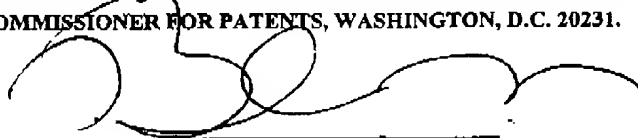
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**PATENT
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ROLAND K. BOWLER II

In re application of)	
)	Atty. Docket No. 8313
MISZCZAK ET AL.)	
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37 CFR 1.192 TRANSMITTAL

Assistant Commissioner for Patents
Washington D.C. 20231

COPY

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For: "Ultra Low Carbon Metal-Core Weld Wire")	

APPEAL BRIEF UNDER 37 CFR 1.192

Assistant Commissioner for Patents
Washington D.C. 20231

SIR:

Real Party In Interest

The real party in interest is ILLINOIS TOOL WORKS INC., by virtue of an assignment executed by the named inventor(s) and duly recorded in the United States Patent Office.

Related Appeals and Interferences

There are no known related appeals or interferences.

Status of Claims

Claims 1 and 3-27 stand rejected and are the subject of the instant appeal. The

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

appealed claims as appended in the section entitled "Claims Pending on Appeal".

Status of Amendments

5 Claim 1 was amended and Claims 21-27 were submitted in a non-final Office
action response under 37 CFR 1.111 filed on 5 September 2000. Claims 3, 8, 11, 12, 13, 15,
22, 26 and 27 were amended in a non-final Office action response under 37 CFR 1.111 filed
on 4 September 2001. The other pending claims stand as filed originally. The appealed claims
are appended in the section entitled "Claims Pending on Appeal".

Summary of Inventions

10 The present inventions relate generally to metal-core weld wires having reduced
fume production, and more particularly to metal-core weld wires having ultra low carbon
15 contents in the sheath thereof, and in some embodiments weld wire having relatively small
amounts of carbon added to the core composition.

 According to some embodiments of the invention, the metal-core weld wires
comprise a sheath having a reduced carbon content, and more particularly in one exemplary
embodiment a metal-core weld wire sheath having not more than approximately 0.008 % C
20 and in another exemplary embodiment a metal-core weld wire sheath having a carbon content
less than approximately 0.005%. According to other embodiments of the invention, the metal-
core weld wires of the present invention, for example those having sheath carbon contents of
not more than 0.008 % C, have small amounts of carbon added to the core composition to
improve the mechanical properties of the weld deposit produced thereby, including for
25 example improved toughness and improved impact strength. Page 5, lines 20 - 25, page 6, lines
6-15, page 8, line 7-21.

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

In some embodiments, the metal-core composition comprises between approximately 0.0020 % C and approximately 0.0047 % C, and the metal-core composition is between approximately 16 % and approximately 20 % of the total weight of the metal-core weld wire. In other embodiments, the metal-core composition comprises between approximately 0.0025 % C and approximately 0.0046 % C, and the metal-core composition is between approximately 17 % and approximately 19 % of the total weight of the metal-core weld wire. And in still other embodiments, the metal-core composition comprises between approximately 0.0027 % C and approximately 0.0042 % C, and the metal-core composition is approximately 18 % of the total weight of the metal-core weld wire. Page 6, lines 6-22, page 7, lines 2-21, and page 8, line 22 - page 10, line 4.

These and other aspects of the invention, including examples, are discussed more fully in the instant specification, including the Background, Detailed Description and Claims thereof.

Issues for Consideration on Appeal

Whether Claim 1 and Claims 3-27 are obvious under 35 U.S.C. § 103 in view of U.S. Patent No. 5,824,992 (Nagarajan) in view of U.S. Patent No. 5,192,851 (James) and U.S. Patent No. 5,365,036 (Crockett).

Grouping of Claims

Claims 1 and 3-27 do not stand or fall together regarding the rejection thereof under 35 U.S.C. § 103.

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

Discussion Of Allowability of Claims 1 & 3-20

Claim Limitations At Issue

5 The limitations at issue are reproduced in part and discussed below. The complete claims are appended in the section entitled "Claims Pending on Appeal".

Examiner's Allegation

10 Claims 1 and 3-20 stand finally rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,824,992 (Nagarajan) in view of U.S. Patent No. 5,192,851 (James) and U.S. Patent No. 5,365,036 (Crockett). Official Action, 8 April 2002, para. 3.

15 The Examiner concedes that the claimed ranges are outside that of the prior art but alleges that the claims are prima facie obvious due to the close proximity of the ranges disclosed by Nagarajan in view of James and Crockett. Official Action, 8 April 2002, para. 3; Official Action, 22 October 2001, para. 3; and Official Action, 23 October 2000, para. 4. The Examiner's particular assertions supporting the obviousness rejections are discussed more fully below.

Applicants' Argument

20 Regarding independent Claim 1, contrary to the Examiner's allegation, Nagarajan, James and Crockett, alone or in combination, fail disclose or suggest a "metal-core weld wire" comprising

25 ... a low carbon steel sheath having a carbon content of less than 0.005 % C;
 a metal-core composition between approximately 16 % and approximately 20 % of a total weight of the metal-core

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

weld wire ...

as recited in independent Claim 1 and the claims that depend therefrom.

Nagarajan discloses reducing the oxygen content in metal-core weld wires by using low oxygen iron powders and/or by reducing core fill percentages. In Nagarajan, the carbon content sheath is between 0.005-0.150 %, and the metal-core composition is between 0.001-12 % total weight of the weld wire. The Examiner concedes that Nagarajan alone does not suggest the ranges claimed, and particularly that the carbon content of Nagarajan is above the range claimed and that the metal-core composition of Nagarajan is below the range claimed. The Examiner seemingly relies however on a combination of Nagarajan with James and Crockett to support the rejection for obviousness under 35 U.S.C. § 103.

Contrary to the Examiner's contention, there is no motivation or suggestion to modify or combine the prior art references as asserted by the Examiner. James and Crockett both fail to disclose or suggest a metal-core weld wire comprising "... a low carbon steel sheath having a carbon content of less than 0.005 % C; a metal-core composition between approximately 16 % and approximately 20 % of a total weight of the metal-core weld wire" as recited in Claim 1.

The Examiner does not even cite James or Crockett for teaching the claimed sheath carbon content and the metal-core composition weight. James discloses nothing about fume reduction in a weld wire. James is cited for teaching only the "... use of Si and Al ... because of strength enhancement...." Official Action, 8 April 2002, para. 3. Crockett discloses flux core (not metal-core) weld wires with aluminum for reducing fumes. The Examiner alleges that Crockett discloses carbon in the weld wire sheath, but the Examiner does not assert that the carbon ranges disclosed by Crockett render the carbon ranges of the present invention obvious. The ranges of Crockett do not overlap the subject matter of the claimed inventions. The Examiner inexplicably contends that it would have been obvious to "... measure fume generation as taught by Crockett et al. for the Nagarajan et al. wire because it would characterize the welding wire and deposit more completely." Official action 8 April 2002.

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

para. 3. The Examiner's alleged motivation for the dubious combination of Crockett and Nagarajan "... to characterize the welding wire and deposit more completely..." is nonsensical and nevertheless unrelated to the subject matter of Claim 1.

James and Crockett fail to suggest modifying Nagarajan and/or a combination
5 of Nagarajan, James and Crockett that renders the claims obvious under 35 U.S.C. § 103. Claim 1 and the claims that depend therefrom are thus patentably distinguished over Nagarajan, Crockett and James and in condition for allowance.

Claim 3, dependent from Claim 1, recites "... the total weight of the metal-core
weld wire comprises between approximately 0.005 % C and approximately 0.013 % C."
10 Claim 1 limits the amount of carbon in the sheath to "... less than 0.005 % C ...", and thus the balance of the carbon is in the metal-core composition. This combination is not disclosed or suggested by Nagarajan alone or in combination with Crockett and James.

Claim 8, dependent from Claim 1, recites "... the metal-core composition
comprising not more than approximately 0.0047 % C" This core carbon content range in
15 combination with a carbon content in the sheath that is "... less than 0.005 % C ..." as recited in Claim 1 is not disclosed or suggested by Nagarajan, Crockett or James.

Claim 11, also dependent from Claim 1, recites "... the metal-core composition
is between approximately 17 % and approximately 19 % of the total weight of the metal-core
weld wire, the metal-core composition comprising not more than approximately 0.0046 % C."
20 This core carbon content range in combination with a carbon content in the sheath that is "... less than 0.005 % C ..." as recited in Claim 1 is not disclosed or suggested by Nagarajan, Crockett or James. Claim 15 depends from Claim 12 and recites a range similar to that recited in Claim 11. Claim 15 is thus believed to be allowable at least for the same reasons as Claim 11.

25 Regarding Claims 4, 9, 10, 12-14 and 16, Nagarajan, Crockett and James fail to disclose or suggest metal-core weld wires having the various combinations of Fe-Mn, Fe-Si, Fe-Mn-Si and Fe-Ti in the core composition as recited in Claims 4, 9, 10, 12-14 and 16.

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

Contrary to the Examiner's assertion, the disclosure by Nagarajan and /or James of elements of Mn, Fe, Si and Ti in isolation is not the same as the compounds Fe-Mn, Fe-Si and Fe-Ti recited in the claimed inventions. Moreover, the Examiner's computational yields for the Fe-Mn, Fe-Si and Fe-Ti compounds based upon the isolated Mn, Fe, Si and Ti elements disclosed by Nagarajan and Crockett has absolutely no basis in the prior art and is of questionable technical validity.

Regarding Claim 4, dependent from Claim 1, Nagarajan, Crockett and James fail to disclose or suggest "... the total weight of the metal-core weld wire comprises between approximately 4.0 % Mn and approximately 4.5 % Mn, and between approximately 2.2 % Si and approximately 2.4 % Si" in combination with the limitations of Claim 1. Claim 4 is therefore believed to be further distinguished over the prior art and in condition for allowance based upon these additional limitations.

Regarding Claim 9, dependent from Claim 1, Nagarajan, Crockett and James fail to disclose or suggest "... the metal-core composition comprises between approximately 1.23 % Fe-Mn and approximately 1.56 % Fe-Mn" in combination with the limitations of Claim 1. Claim 9 is therefore believed to be further distinguished over the prior art and in condition for allowance based upon these additional limitations.

Regarding Claim 10, dependent from Claim 1, Nagarajan, Crockett and James fail to disclose or suggest "... the metal-core composition comprises between approximately 2.40 % Fe-Si and approximately 3.60% Fe-Si, between approximately 10.86 % Fe-Mn-Si and approximately 16.30 % Fe-Mn-Si, between approximately 0.44 % Fe-Ti and approximately 0.66 % Fe-Ti, and the balance Fe powder" in combination with the limitations of Claim 1. Claim 10 is therefore believed to be further distinguished over the prior art and in condition for allowance based upon these additional limitations.

Regarding Claim 12, dependent from Claim 1, Nagarajan, Crockett and James fail to disclose or suggest "... the metal-core composition comprises between approximately 17 % and approximately 19 % of a total weight of the metal-core weld wire, and the metal-core

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

composition comprising not more than approximately 1.62 % Fe-Mn" in combination with the limitations of Claim 1. Claim 12 is therefore believed to be further distinguished over the prior art and in condition for allowance based upon these additional limitations.

5 Regarding Claim 13, dependent from Claim 1, Nagarajan, Crockett and James fail to disclose or suggest "... the metal-core composition comprising not more than approximately 3.15% Fe-Si, not more than approximately 14.26 % Fe-Mn-Si, not more than approximately 0.58 % Fe-Ti, and the balance Fe powder" in combination with the limitations of Claim 1. Claim 13 is therefore believed to be further distinguished over the prior art and in condition for allowance based upon these additional limitations.

10 Regarding Claim 14, dependent from Claim 1, Nagarajan, Crockett and James fail to disclose or suggest "... the steel sheath comprises between approximately 0.250 % Mn and approximately 0.500 % Mn, not more than approximately 0.025 % P, not more than approximately 0.015 % S, not more than approximately 0.040 % Si, not more than approximately 0.025 % Al, and not more than approximately 0.005 % N" in combination with
15 the limitations of Claim 1. Claim 14 is therefore believed to be further distinguished over the prior art and in condition for allowance based upon these additional limitations.

 Regarding Claim 16, dependent from Claim 1, Nagarajan, Crockett and James fail to disclose or suggest "... the metal-core composition comprises approximately 18 % of a total weight of the metal-core weld wire, and the metal-core composition comprises
20 approximately 3.00 % Fe-Si, approximately 13.58 % Fe-Mn-Si, approximately 0.55 % Fe-Ti, approximately 1.54 % Fe-Mn, and the balance Fe powder" in combination with the limitations of Claim 1. Claim 16 is therefore believed to be further distinguished over the prior art and in condition for allowance based upon these additional limitations.

 Regarding Claims 17-20, Nagarajan, Crockett and James also fail to disclose
25 or suggest metal-core weld wires having fume generation rates recited in said claims. The Examiner's rejection does not specifically address these limitations, other than to assert that it would have been obvious "... to measure fume generation as taught by Crockett et al. for the

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

Nagarajan et al. wire because it would characterize the welding wire and deposit more completely." This general assertion however does not establish that the prior meets the specific limitations of the Claims 17-20, which depend from Claim 1.

Regarding Claim 17, Nagarajan, Crockett and James fail to disclose or suggest
5 a metal-core weld wire having "... a fume generation rate of approximately 0.26 gm./min. when welding with a 100 % CO₂ shielding gas." Regarding Claim 18, Nagarajan, Crockett and James fail to disclose or suggest a metal-core weld wire "... having a fume generation rate of approximately 0.38 gm./min. when welding with a 75 % Ar and 25 % CO₂ shielding gas mixture." Regarding Claim 19, Nagarajan, Crockett and James fail to disclose or suggest a
10 metal-core weld wire having "... a fume generation rate of approximately 0.34 gm./min. when welding with an 82 % Ar and 18 % CO₂ shielding gas mixture." Regarding Claim 20, Nagarajan, Crockett and James fail to disclose or suggest a metal-core weld wire having "... a fume generation rate of approximately 0.32 gm./min. when welding with an 92 % Ar and 8 % CO₂ shielding gas mixture." Claims 17-20 are therefore believed to be further distinguished
15 over the prior art and in condition for allowance based upon these additional limitations.

Discussion Of Allowability of Claims 21-27

Claim Limitations At Issue

The limitations at issue are reproduced in part and discussed below. The complete claims are appended in the section entitled "Claim Pending on Appeal".

Examiner's Allegation

20 Claims 21-27 stand finally rejected under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 5,824,992 (Nagarajan) in view of U.S. Patent No. 5,192,851 (James) and U.S. Patent No. 5,365,036 (Crockett). Official Action, 8 April 2002, para. 3.

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

25 The Examiner concedes that the claimed ranges are outside that of the prior art but alleges that the claims are prima facie obvious due to the close proximity of the ranges disclosed by Nagarajan in view of James and Crockett. Official Action, 8 April 2002, para. 3; Official Action, 22 October 2001, para. 3; and Official Action, 23 October 2000, para. 4. The Examiner's particular contentions supporting the obviousness rejections are discussed more fully below.

30 **Applicants' Argument**

Regarding independent Claim 21, contrary to the Examiner's allegation, Nagarajan, James and Crockett, alone or in combination, fail to disclose or suggest a "metal-core weld wire" comprising:

35 ... a low carbon steel sheath having a carbon content of not more than approximately 0.008 % C;
a metal-core composition between approximately 16 % and approximately 20 % of a total weight of the metal-core weld wire,
40 the metal-core composition comprises between approximately 0.0019 % C and approximately 0.0047 % C based on the total weight of the metal-core weld wire

as recited in independent Claim 21 and the claims that depend therefrom.

As noted above, Nagarajan discloses reducing oxygen content in metal-core weld wires by using low oxygen iron powders and/or by reducing core fill percentages. In
45 Nagarajan, the metal-core composition is between 0.001-12 % total weight of the weld wire, which is much less than a "... metal-core composition between approximately 16 % and approximately 20 % of a total weight of the metal-core weld wire ..." recited in Claim 21.

Nagarajan also fails to disclose or suggest a "... metal-core composition compris[ing] between approximately 0.0019 % C and approximately 0.0047 % C based on the
50 total weight of the metal-core weld wire" as recited in Claim 21. In Nagarajan, the Examiner

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

concedes that the carbon content of the metal-core composition is approximately 0.005-0.030 wt %, which is greater than the range in Claim 21, but the Examiner relies on a combination of Nagarajan with James and Crockett to support the rejections for obviousness under 35 U.S.C. § 103.

5 Contrary to the Examiner's contention, there is no motivation or suggestion to modify or combine the prior art references as asserted by the Examiner. James and Crockett both fail to disclose or suggest "... a low carbon steel sheath having a carbon content of not more than approximately 0.008 % C ... a metal-core composition between approximately 16 % and approximately 20 % of a total weight of the metal-core weld wire" wherein the "...
10 metal-core composition comprises between approximately 0.0019 % C and approximately 0.0047 % C based on the total weight of the metal-core weld wire" as recited in Claim 21.

 The Examiner does not even cite James and Crockett for teaching the claimed metal-core composition weight and carbon content. James discloses nothing about fume reduction in a weld wire. James is cited for teaching only the "... use of Si and Al ... because
15 of strength enhancement..." Official Action, 8 April 2002, para. 3. Crockett discloses flux core weld wires with aluminum for reducing fumes. The Examiner inexplicably contends that it would have been obvious to "... measure fume generation as taught by Crockett et al. for the Nagarajan et al. wire because it would characterize the welding wire and deposit more completely." Official action 8 April 2002, para. 3. The Examiner's alleged motivation for the
20 dubious combination of Crockett and Nagarajan "... to characterize the welding wire and deposit more completely..." is nonsensical and nevertheless unrelated to the subject matter of Claim 21.

 James and Crockett fail to suggest modifying Nagarajan and/or a combination of Nagarajan, James and Crockett that renders the claims obvious under 35 U.S.C. § 103.
25 Claim 21 and the claims that depend therefrom are thus patentably distinguished over Nagarajan, Crockett and James and in condition for allowance.

 Claim 22, dependent from Claim 21, recites "... the metal-core composition

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

between approximately 17 % and approximately 19 % of the total weight of the metal-core weld wire, the metal-core composition comprising not more than approximately 0.0046 % C based on the total weight of the metal-core weld wire." These limitations are not disclosed or suggested by Nagarajan, Crockett or James, and the Examiner makes no assertion otherwise.

5 Claim 22 is thus allowable for these additional reasons.

Regarding Claims 23-27, Nagarajan, Crockett and James fail to disclose or suggest metal-core weld wires having the various combinations of Fe-Mn, Fe-Si, Fe-Mn-Si and Fe-Ti in the core composition as recited in Claims 23-27. Contrary to the Examiner's assertion, the disclosure by Nagarajan and /or James of elements of Mn, Fe, Si and Ti in
10 isolation is not the same as the compounds Fe-Mn, Fe-Si and Fe-Ti recited in the claimed inventions. Moreover, the Examiner's computational yields for the Fe-Mn, Fe-Si and Fe-Ti compounds based upon the isolated Mn, Fe, Si and Ti elements disclosed by Nagarajan and Crockett has absolutely no basis in the prior art and is of questionable technical validity.

Regarding Claim 23, dependent from Claim 21, Nagarajan, Crockett and James
15 fail to disclose or suggest "...the metal-core composition comprises between approximately 1.46 % Fe-Mn and approximately 1.62 % Fe-Mn." in combination with the limitations of Claim 21. Claim 23 is therefore believed to be further distinguished over the prior art and in condition for allowance based upon these additional limitations.

Regarding Claim 24, dependent from Claim 21, Nagarajan, Crockett and James
20 fail to disclose or suggest "... the metal-core composition comprises between approximately 2.85 % Fe-Si and approximately 3.15% Fe-Si, between approximately 12.90 % Fe-Mn-Si and approximately 14.26 % Fe-Mn-Si, between approximately 0.52 % Fe-Ti and approximately 0.58 % Fe-Ti, and the balance Fe powder and trace impurities" in combination with the limitations of Claim 21. Claim 24 is therefore believed to be further distinguished over the
25 prior art and in condition for allowance based upon these additional limitations.

Regarding Claim 25, dependent from Claim 21, Nagarajan, Crockett and James fail to disclose or suggest "... the steel sheath comprises between approximately 0.250 % Mn

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

and approximately 0.500 % Mn, not more than approximately 0.025 % P, not more than approximately 0.015 % S, not more than approximately 0.040 % Si, not more than approximately 0.025 % Al, and not more than approximately 0.005 % N" in combination with the limitations of Claim 21. Claim 25 is therefore believed to be further distinguished over the prior art and in condition for allowance based upon these additional limitations.

Regarding Claim 26, dependent from Claim 21, Nagarajan, Crockett and James also fail to disclose or suggest "... the metal-core composition comprising not more than approximately 1.56 % Fe-Mn " in combination with the limitations of Claim 21. Claim 26 is therefore believed to be further distinguished over the prior art and in condition for allowance based upon these additional limitations.

Regarding Claim 27, dependent from Claim 21, Nagarajan, Crockett and James also fail to disclose or suggest "... the metal-core composition comprising not more than approximately 3.60% Fe-Si, not more than approximately 16.30 % Fe-Mn-Si, not more than approximately 0.66 % Fe-Ti, and the balance Fe powder " in combination with the limitations of Claim 21. Claim 27 is therefore believed to be further distinguished over the prior art and in condition for allowance based upon these additional limitations.

Discussion of Affidavit Under 37 C.F.R. § 1.132

Examiner's Allegation

The Examiner acknowledges Applicants' perfected Affidavit submitted on 15 March 2002 and has apparently withdrawn the formal objections (for lack of initials and dates on changes made by Affiant) to the Affidavit submitted originally on 6 September 2001.

In the Official Action, 8 April 2002, para. 1, the Examiner maintains that Applicants' Affidavit under 37 CFR 1.132 is insufficient to over come the rejection of the claims, allegedly because the Affidavit "... refer(s) only to the system described in the above

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

referenced application and not to the individual claims of the application. There is no showing that the objective evidence of non-obviousness is commensurate in scope with the claims." Official Action, 8 April 2002, para. 1.

Applicants' Argument

5 Contrary to the Examiner's contention, para. 7 of the perfected Affidavit of 15 March 2002 (and the original Affidavit filed on 6 September 2001) includes an explicit statement that the composition of the "FabCOR80XLS" and "Eclipse ULTIMET 716" weld wires sold by ITW Hobart, a Division of Illinois Tool Works Inc., the assignee of the referenced patent application, have compositions corresponding to the subject matter of at least
10 one or both of the independent claims (Claims 1 & 21) pending in the instant patent application.

The Affidavit and supporting factual evidence establish that the subject matter of the claimed inventions overcome problems in the art; namely, low fume producing metal-core weld wires that comply with industry strength and toughness specifications. The low
15 fume weld wires of the present invention were developed partly in response to industry demand, and address problems heretofore unsolved by others.

The Affidavit and supporting evidence also establish that the metal-core weld wires of the present invention are commercially successful. Particularly, the sales of low fume metal-core weld wires of the present invention were substantial upon introduction thereof into
20 the marketplace because they substantially reduced fumes without loss of performance characteristics, which is what industry required. Sales grew substantially the second year of sales, and continues to grow.

Particularly relevant to the commercial success of the present invention is the fact that, for at least one large customer's applications, the metal-core weld wires of the present
25 invention substantially displaced the use and purchase by the customer from ITW Hobart

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

Canada flux-core weld wires (which generate comparatively more fumes).

The Affidavit and supporting evidence establish a nexus between the subject matter of the claimed inventions and the successful commercial embodiments thereof. The Affidavit and supporting evidence establish further that the commercial success is attributable to the claimed invention. Particularly, the metal-core weld wires are commercially successful because they have reduced fume production without loss of performance.

The remarks above addressing the rejections under 35 U.S.C. 103, especially when taken in consideration with the perfected Affidavit under 37 CFR 1.132, overwhelmingly defeat the Examiner's tenuous obviousness allegations. Kindly reverse and vacate the rejections of Claims 1 and 3-27 and instruct the Examiner to allow said Claims to issue as a United States Patent without further delay.

Respectfully submitted,



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MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,247
Examiner M. Elve
Art Unit 1725

CLAIMS PENDING ON APPEAL

1. (Once Amended) A metal-core weld wire for gas shielded welding, comprising:

a low carbon steel sheath having a carbon content of less than 0.005 % C;

a metal-core composition between approximately 16 % and approximately 20 % of a total weight of the metal-core weld wire,

whereby the metal-core weld wire has a relatively reduced fume generation rate.

3. (Once Amended) The metal-core weld wire of Claim 1, the total weight of the metal-core weld wire comprises not more than approximately 0.013 % C.

4. (Not Amended) The metal-core weld wire of Claim 1, the total weight of the metal-core weld wire comprises between approximately 4.0 % Mn and approximately 4.5 % Mn, and between approximately 2.2 % Si and approximately 2.4 % Si.

5. (Not Amended) The metal-core weld wire of Claim 1, the steel sheath comprises between approximately 0.35 % Mn and approximately 0.45 % Mn.

6. (Not Amended) The metal-core weld wire of Claim 1, the steel sheath comprises between approximately 0.250 % Mn and approximately 0.500 % Mn, not more than approximately 0.025 % P, not more than approximately 0.015 % S, not more than

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

approximately 0.040 % Si, not more than approximately 0.025 % Al, and not more than approximately 0.005 % N.

7. (Not Amended) The metal-core weld wire of Claim 6, the steel sheath comprises approximately 0.370 % Mn, approximately 0.005 % P, approximately 0.009 % S, approximately 0.007 % Si, approximately 0.022 % Al, and approximately 0.003 % N.

8. (Once Amended) The metal-core weld wire of Claim 1, the metal-core composition comprising not more than approximately 0.0047 % C.

9. (Not Amended) The metal-core weld wire of Claim 1, the metal-core composition comprises between approximately 1.23 % Fe-Mn and approximately 1.56 % Fe-Mn.

10. (Not Amended) The metal-core weld wire of Claim 1, the metal-core composition comprises between approximately 2.40 % Fe-Si and approximately 3.60 % Fe-Si, between approximately 10.86 % Fe-Mn-Si and approximately 16.30 % Fe-Mn-Si, between approximately 0.44 % Fe-Ti and approximately 0.66 % Fe-Ti, and the balance Fe powder.

11. (Once Amended) The metal-core weld wire of Claim 1, the metal-core composition is between approximately 17 % and approximately 19 % of the total weight of the metal-core weld wire, the metal-core composition comprising not more than approximately

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

0.0046 % C.

12. (Once Amended) The metal-core weld wire of Claim 1, the metal-core composition comprises between approximately 17 % and approximately 19 % of a total weight of the metal-core weld wire, and the metal-core composition comprising not more than approximately 1.62 % Fe-Mn.

13. (Once Amended) The metal-core weld wire of Claim 12, the metal-core composition comprising not more than approximately 3.15% Fe-Si, not more than approximately 14.26 % Fe-Mn-Si, not more than approximately 0.58 % Fe-Ti, and the balance Fe powder.

14. (Not Amended) The metal-core weld wire of Claim 12, the steel sheath comprises between approximately 0.250 % Mn and approximately 0.500 % Mn, not more than approximately 0.025 % P, not more than approximately 0.015 % S, not more than approximately 0.040 % Si, not more than approximately 0.025 % Al, and not more than approximately 0.005 % N.

15. (Twice Amended) The metal-core weld wire of Claim 12, the metal-core composition comprising not more than approximately 0.0046 % C.

16. (Not Amended) The metal-core weld wire of Claim 1, the metal-core

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

composition comprises approximately 18 % of a total weight of the metal-core weld wire, and the metal-core composition comprises approximately 3.00 % Fe-Si, approximately 13.58 % Fe-Mn-Si, approximately 0.55 % Fe-Ti, approximately 1.54 % Fe-Mn, and the balance Fe powder.

17. (Not Amended) The metal-core weld wire of Claim 12 having a fume generation rate of approximately 0.26 gm./min. when welding with a 100 % CO₂ shielding gas.

18. (Not Amended) The metal-core weld wire of Claim 12 having a fume generation rate of approximately 0.38 gm./min. when welding with a 75 % Ar and 25 % CO₂ shielding gas mixture.

19. (Not Amended) The metal-core weld wire of Claim 12 having a fume generation rate of approximately 0.34 gm./min. when welding with an 82 % Ar and 18 % CO₂ shielding gas mixture.

20. (Not Amended) The metal-core weld wire of Claim 12 having a fume generation rate of approximately 0.32 gm./min. when welding with an 92 % Ar and 8 % CO₂ shielding gas mixture.

21. (Not Amended) A low fume metal-core weld wire for gas shielded welding, comprising:

a low carbon steel sheath having a carbon content of not more than

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

approximately 0.008 % C;

a metal-core composition between approximately 16 % and approximately 20 % of a total weight of the metal-core weld wire,

the metal-core composition comprises between approximately 0.0019 % C and approximately 0.0047 % C based on the total weight of the metal-core weld wire.

22. (Once Amended) The metal-core weld wire of Claim 21, the metal-core composition between approximately 17 % and approximately 19 % of the total weight of the metal-core weld wire, the metal-core composition comprising not more than approximately 0.0046 % C based on the total weight of the metal-core weld wire.

23. (Not Amended) The metal-core weld wire of Claim 22, the metal-core composition comprises between approximately 1.46 % Fe-Mn and approximately 1.62 % Fe-Mn.

24. (Not Amended) The metal-core weld wire of Claim 23, the metal-core composition comprises between approximately 2.85 % Fe-Si and approximately 3.15 % Fe-Si, between approximately 12.90 % Fe-Mn-Si and approximately 14.26 % Fe-Mn-Si, between approximately 0.52 % Fe-Ti and approximately 0.58 % Fe-Ti, and the balance Fe powder and trace impurities.

25. (Not Amended) The metal-core weld wire of Claim 24, the steel sheath comprises between approximately 0.250 % Mn and approximately 0.500 % Mn, not more than approximately 0.025 % P, not more than approximately 0.015 % S, not more than

MISZCZAK ETAL.
"Ultra Low Carbon Metal-Core Weld Wire"
Atty. Docket No. 8313

Appl. No. 09/227,242
Examiner M. Elve
Art Unit 1725

approximately 0.040 % Si, not more than approximately 0.025 % Al, and not more than approximately 0.005 % N.

26. (Once Amended) The metal-core weld wire of Claim 21, the metal-core composition comprising not more than approximately 1.56 % Fe-Mn.

27. (Once Amended) The metal-core weld wire of Claim 26, the metal-core composition comprising not more than approximately 3.60% Fe-Si, not more than approximately 16.30 % Fe-Mn-Si, not more than approximately 0.66 % Fe-Ti, and the balance Fe powder.